NORYL GTX™ RESIN GTX9600

DESCRIPTION

NORYL GTX9600 is an unfilled, high heat, chemically resistant blend of polyphenylene ether (PPE) and polyamide (PA) that exhibits superior low-temperature ductility. This injection moldable resin is designed for evaluation in applications that require both high heat resistance, for exposure such as E-coat or paint baking, as well as low-temperature ductility for cold weather impact. NORYL GTX9600 may provide ductile impact behavior down to -40°C. Automotive applications including electric vehicle battery protection and body-in-white energy absorption structures, should consider evaluating GTX9600 as a potential solution. Additionally, other applications that require performance at both high and low temperatures should also evaluate its suitability.

GENERAL INFORMATION	
Features	Good Processability, Hydrolytic Stability, Low Warpage, Low Shrinkage, Low Specific Gravity, Enhanced mold release, Dimensional stability, High temperature resistance, Impact resistant, Low temperature impact, No PFAS intentionally added
Fillers	Unreinforced
Polymer Types	Polyphenylene Ether + PA (PPE+Nylon)
Processing Techniques	Injection Molding

INDUSTRY	SUB INDUSTRY
Automotive	Automotive EV Batteries, Heavy Truck, Automotive Crash and Chassis, Bus, Automotive Under the Hood, Automotive Exteriors, Motorcycle, Recreational/Specialty Vehicles
Consumer	Commercial Appliance

TYPICAL PROPERTY VALUES

Revision 20241014

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
MECHANICAL [1]			
Tensile Stress, yield, 50 mm/min	41	MPa	ISO 527
Tensile Stress, break, 50 mm/min	39	MPa	ISO 527
Tensile Strain, yield, 50 mm/min	4	%	ISO 527
Tensile Strain, break, 50 mm/min	70	%	ISO 527
Tensile Modulus, 1 mm/min	1591	MPa	ISO 527
Flexural Modulus, 2 mm/min	1348	MPa	ISO 178
Flexural Stress, yield, 2 mm/min	58	MPa	ISO 178
Flexural Stress, break, 2 mm/min	58	MPa	ISO 178
Tensile Modulus, 50 mm/min	1547	MPa	ASTM D638
Tensile Strain, brk, Type I, 50 mm/min	73	%	ASTM D638
Tensile Strain, yld, Type I, 50 mm/min	4	%	ASTM D638
Tensile Stress, brk, Type I, 50 mm/min	39	MPa	ASTM D638
Tensile Stress, yld, Type I, 50 mm/min	41	MPa	ASTM D638
Flexural Modulus, 1.3 mm/min, 50 mm span	1450	MPa	ASTM D790
Flexural Stress, yld, 1.3 mm/min, 50 mm span	57	MPa	ASTM D790
Flexural Stress, brk, 1.3 mm/min, 50 mm span	59	MPa	ASTM D790
IMPACT [1]			
Izod Impact, notched 80*10*4 +23°C	65	kJ/m²	ISO 180/1A
Izod Impact, notched 80*10*4 -30°C	57	kJ/m²	ISO 180/1A

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Izod Impact, unnotched 80*10*4 +23°C	176	kJ/m²	ISO 180/1U
Izod Impact, unnotched 80*10*4 -30°C	179	kJ/m²	ISO 180/1U
Charpy 23°C, V-notch Edgew 80*10*4 sp=62mm	69	kJ/m²	ISO 179/1eA
Charpy 23°C, Unnotch Edgew 80*10*4 sp=62mm	250	kJ/m²	ISO 179/1eU
Izod Impact, notched, 23°C	773	J/m	ASTM D256
Izod Impact, notched, -30°C	585	J/m	ASTM D256
Izod Impact, unnotched, 23°C	1290	J/m	ASTM D4812
Izod Impact, unnotched, -30°C	1153	J/m	ASTM D4812
Instrumented Dart Impact Total Energy, 23°C	51	J	ASTM D3763
THERMAL [1]			
HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm	164	°C	ISO 75/Bf
HDT, 0.45 MPa, 3.2 mm, unannealed	170	°C	ASTM D648
Vicat Softening Temp, Rate B/50	153	°C	ISO 306
Vicat Softening Temp, Rate B/120	156	°C	ISO 306
Vicat Softening Temp, Rate B/50	151	°C	ASTM D1525
Vicat Softening Temp, Rate B/120	155	°C	ASTM D1525
Vicat Softening Temp, Rate A/50	219	°C	ASTM D1525
Vicat Softening Temp, Rate A/120	218	°C	ASTM D1525
CTE, -40°C to 40°C, flow	1.1E-04	1/°C	ISO 11359-2
CTE, -40°C to 40°C, xflow	1.2E-04	1/°C	ISO 11359-2
CTE, -40°C to 40°C, flow	1.1E-04	1/°C	ASTM E831
CTE, -40°C to 40°C, xflow	1.2E-04	1/°C	ASTM E831
PHYSICAL [1]			
Density	1.05	g/cm³	ISO 1183
Moisture absorption (23°C/50% RH)	0.15	%	-
Water Absorption, (23°C/saturated)	4.5	%	ISO 62-1
Water Absorption, (23°C/24hrs)	0.57	%	ISO 62-1
Mold Shrinkage, flow [2]	1.1 – 1.5	%	SABIC method
Mold Shrinkage, xflow [2]	1.0 – 1.4	%	SABIC method
Melt Flow Rate, 280°C/5.0 kgf	5	g/10 min	ASTM D1238
INJECTION MOLDING [3]			
Drying Temperature	95 – 105	°C	
Drying Time	3 – 4	Hrs	
Drying Time (Cumulative)	8	Hrs	
Maximum Moisture Content	0.07	%	
Melt Temperature	270 – 315	°C	
Rear - Zone 1 Temperature	255 – 315	°C	
Middle - Zone 2 Temperature	260 – 315	°C	
Front - Zone 3 Temperature	265 – 315	°C	
Nozzle Temperature	270 – 315	°C	
Mold Temperature	65 – 115	°C	
Back Pressure	0.3 – 1.4	MPa	
Screw Speed	20 – 100	rpm	
Vent Depth	0.013 – 0.038	mm	

(1) The information stated on Technical Datasheets should be used as indicative only for material selection purposes and not be utilized as specification or used for part or tool design.

(2) Measurements made from laboratory test coupon. Actual shrinkage may vary outside of range due to differences in processing conditions, equipment, part geometry and tool design. It is recommended that mold shrinkage studies be performed with surrogate or legacy tooling prior to cutting tools for new molded article.

(3) Injection Molding parameters are only mentioned as general guidelines. These may not apply or may need adjustment in specific situations such as low shot sizes, large part molding, thin wall molding and gas-assist molding.

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